

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

WEI ET AL.

Serial No.: 09/710,560

Filed: November 9, 2000

For: FLUORESCENT POLYMERIC
ARTICLES HAVING SCREENING
LAYER FORMED FROM U.V. LIGHT
ABSORBING POLYMER



Examiner: Duc Truong

Art Unit: 1711

I hereby certify that this correspondence is being deposited with the U. S. Postal Service as first class mail in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231, on October 22, 2002

Paulette K. Haseltine
PAULETTE K. HASELTINE

DECLARATION OF DREW J. BUONI UNDER 37 CFR 1.132

Honorable Commissioner of
Patents and Trademarks
Box Non-Fee Amendment
Washington, D.C. 20231

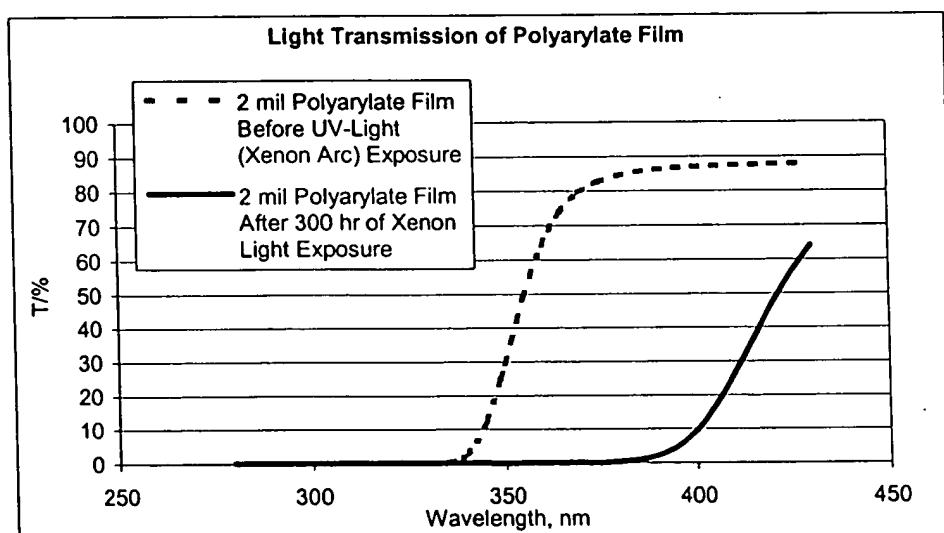
I, Drew J. Buoni, in support of the above-identified patent application, do declare and state as follows:

1. I received a Bachelor of Science degree from the University of Cincinnati in 1994. My major course of study was Chemical Engineering. I have been employed by Avery Dennison Corporation, the assignee of the above-identified patent application, and its predecessor-in-interest for over 6 years. My current job title is Business Director for Reflective Films. Previously, I served as the Technical Director for Reflective Films. During the course of my work at Avery Dennison, I have gained knowledge and experience in the field of the manufacture, use, and performance properties of polymer sheeting products, for a variety of different polymer materials and their additives, including fluorescent materials and fluorescent colorants.

2. I am a co-inventor of the above-identified patent application. The other two co-inventors, Dr. Guang-Xue Wei and Ms. Kimberly A. Dockus, worked under my supervision on the development of the sheeting products disclosed and claimed.

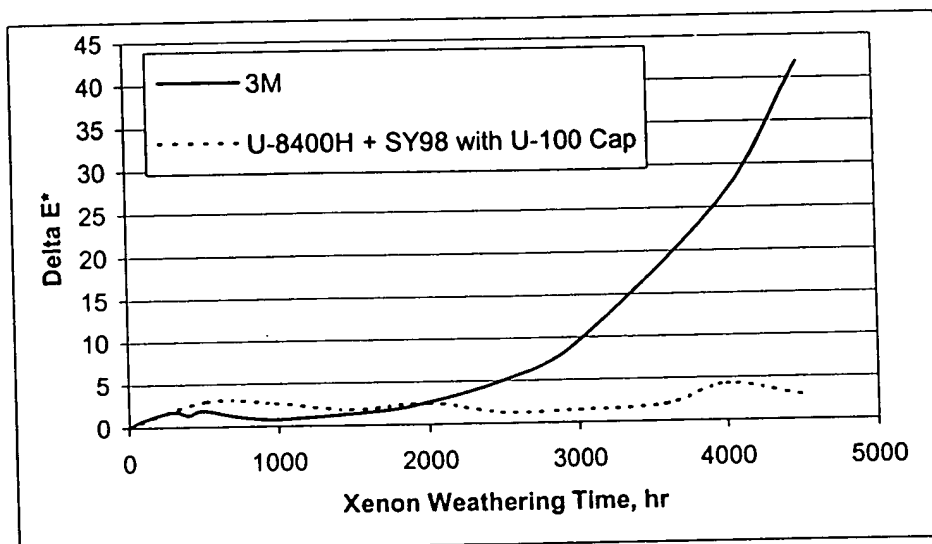
3. Fluorescent dyes are extremely photosensitive, and the behavior of different fluorescent colorants in different polymer matrices is inherently unpredictable. In particular, one cannot predict the color durability of different fluorescent colorants in different polymer matrices.

4. Polyarylate is a polymer that initially allows significant transmission of ultraviolet light. After exposure to ultraviolet light, the polyarylate polymer backbone undergoes photo-Fries rearrangement. The resulting structure still transmits visible light, but blocks a significant portion of ultraviolet light. The graph below illustrates the percent ultra violet light transmission of polyarylate before exposure to UV light, and after 300 hours of exposure to Xenon Arc UV light.



It may be seen that before exposure to UV light, the polyarylate allows nearly 90% transmission of UV light in about the 350-400 nm wavelength range. After 300 hours of xenon arc UV light exposure, the transmission of UV light through the polyarylate is in the range of about 0-10%.

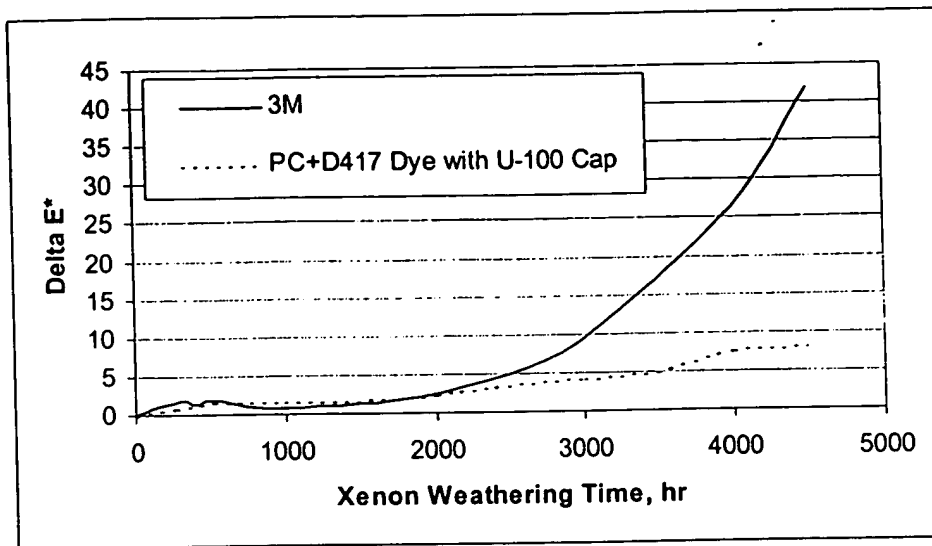
5. We compared the color durability of fluorescent sheeting materials made with the instant invention with another commercially available prior art fluorescent sheeting material. The prior art commercial sheeting material used was Minnesota Mining and Manufacturing Company's Scotchlite Diamond Grade Fluorescent VIP reflective prismatic sheeting, sold under the product designation 3983 Fluorescent Yellow-Green. In the product made in accordance with the instant invention, the color layer was a polyarylate/polyester blend with Solvent Yellow 98 fluorescent colorant (U-8400H + SY98), and the screening layer was polyarylate (U-100 Cap). The figure below illustrates the change in color, represented by ΔE^* , of the two products.



The graph shows that while the prior art 3M product began to undergo a noticeable color shift after about 2500 hours of xenon arc ultraviolet light exposure, the sheeting product of the instant invention still showed excellent fluorescent color durability after 4000 hours of xenon arc ultraviolet light exposure.

6. We also compared the color durability of the same prior art sample with another product made in accordance with the instant invention. In this case, in the product of the invention the color layer comprised a polycarbonate with Huron D-417 fluorescent colorant (PC + D417 dye), and the screening layer was polyarylate (U-100 Cap). Both samples were exposed to xenon arc ultraviolet light. The figure below illustrates the change in color, represented by ΔE^* , of the two products.

The graph shows that the product of the instant invention showed significantly improved color durability as compared to the prior art product.




7. I have reviewed the prior art cited by the Examiner against the above-identified patent application. I note that the reference of Siclovan et al., WO 00/26275, discloses weatherable block copolyestercarbonates, and blends containing them. A specific goal of Siclovan is to prevent “photoyellowing” of the polymer materials. To my knowledge, there is no relationship between whether a polymer material will yellow when exposed to ultraviolet light, and whether that same polymer material will act as a UV screen layer for a fluorescent color layer. For example, acrylics are known for their excellent weatherability in terms of their resistance to photoyellowing. Yet acrylics are notoriously poor hosts for fluorescent colorants, as shown by the data in Example 3 and 4 of the Pavelka patent. The “weatherability” property described by Siclovan et al. is not the same thing as the protection of the color durability of a fluorescent color in an underlying layer. Because these are different properties, one skilled in the art would not have been led by the Siclovan disclosure to use the Siclovan polymer blends as screening layers over fluorescent colorants.

8. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are

punishably by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Dated: October 22, 2002


By: Drew J. Buoni Oct 22, 02